

EVALUATION OF RICE DESSERT MANUFACTURED WITH DIFFERENT TYPES OF MILK

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ABSTRACT

Rice dessert is an Egyptian dairy dessert was prepared by using whole buffalo's, ewe's cow's camel's and goat's milk as control. All treatments were carried out by standardizing milk to 1, 2 and 3% fat.

Results indicated that the best organoleptic scores were obtained from buffalo's milk being as the control. Those made from ewe's milk possessed higher scores than the other types of milk. Cow's and camel's milk exhibited almost the same scores, while goat's milk showed the lowest values. Rice dessert made from all types of milk with low fat content were also acceptable.

The nutritive value of the products were determined. Generally, quality of the products were directly correlated with both the type of milk (buffalo's and ewe's were the prefer) and the percentage of the fat in milk (whole milk was preferred than the low fat).

Keywords: Rice milk, Egyptian dairy dessert, buffaloes milk. Ewe milk, camel milk, goat milk, cow milk.

INTRODUCTION

Rice dessert is a popular dairy dessert product in Egypt and in some European countries. It is desired among people of different ages: infants, children, adults and elderly. This product is consumed daily, but its consumption is increased in Ramadan month and feast days, due to its pleasant and satiating power.

Phirni is considered the most important Indian dry dessert which is prepared in a similar way to rice dessert by boiling buffalo's milk with rice and sugar as reported by Mathur *et al* (1985).

Limited data are available about manufacturing and properties of rice dessert.

Rice is a healthy food. It is of a complex carbohydrate as it contains starch and fibers. Complex carbohydrates are digested slowly, allowing the body to utilize the energy released over a longer period which is nutritionally efficient.

Rice contains useful quantities of potassium, the B group, thiamine and niacin. Moreover, rice contains only a trace amount of fat and free from cholesterol. Rice is also gluten free, so it is considered suitable for coeliacs and it is easily digested. Therefore it is a wonderful food for the very young and elderly.

The present study was undertaken to evaluate and compare rice dessert as an Egyptian dessert dish prepared with different types of milk.

MATERIAL AND METHODS

Fresh raw buffalo's, cow's, ewe's and goat's milk were obtained from Sakha and Mahalet Moussa, Animal Production Research Stations at Kafr El-Sheik Governorate. Fresh camel's milk was obtained from private farm in Matrouh Governorate and kept in ice box until used.

Each type of milk was divided into equal four parts and used as follows:

- a. Fresh raw whole milk served as control.
- b. Fresh raw milk standardized to 3% fat.
- c. Fresh raw milk standardized to 2% fat.
- d. Fresh raw milk standardized to 1% fat.

Rice and sugar (sucrose) were obtained from the local market. RD was prepared by boiling: half kilogram of whole buffalo's, ewe's, cow's, camel's and goat's milk, as well as the same types of standardized milk to 3, 2 and 1% fat, were boiled for 5 minutes. 10% rice and 15% sugar cane were added to each treatment with continuous stirring until the desired gelly texture was obtained, after 15 minutes. The resultant products which were cooled to 60°C, were packed in glass containers and stored in the refrigerator at 7°C±1.

Fat, protein, ash and total solids content in fresh raw milks were determined according to A.O.A.C. (1990). Lactose contents were determined using the modified picric method as described by Abulehia (1987).

Rice gross composition was determined according to A.O.A.C. (1990). It contained 10.2% moisture, 82% carbohydrate, 6.0 protein, 0.8% fat and 0.6% dietary fiber.

Samples of all treatments were examined organoleptically by a panel of persons from the staff members of the Food Science Department, Faculty of Agriculture, Ain Shams University, according to the score card suggested by Kaul and Mathur (1982). The products were at 20°C during evaluation. Three replicates were carried out for each treatment.

RESULTS AND DISCUSSION

The composition of the different types of raw milk used in preparing rice dessert is presented in Table (1). Buffalo's and ewe's milk had the highest contents of fat, protein and total solids (T.S) as compared to cow, camel and goat milks. Cow's and camel's milk showed nearly the same composition. Goats milk possessed the lowest value fat (3.5%), protein (2.9%) and T.S (12.08%), while the highest value of lactose (4.9%). These findings were nearly in agreement with those reported by Devenra (1982), Abu Lehia (1987), Mahran *et al* (1990) and Alkanhal (1993).

Table 1. Gross chemical composition of different types of raw whole milks used in making rice dessert

Constituents %	Buffalo milk	Ewe milk	Cow milk	Camel milk	Goat milk
Fat	6.80	5.60	3.70	4.00	3.50
Protein	3.90	3.80	3.20	3.40	2.90
Lactose	4.80	4.78	4.60	4.20	4.90
Ash	0.87	0.88	0.90	0.90	0.78
Total solid	16.37	15.06	12.50	12.50	12.08
SNF	9.57	9.46	8.80	8.50	8.58

* SNF: Solid not fat

Organoleptic properties of rice dessert made with standardized milk and whole milk are presented in Table (2). Rice dessert made from buffalo's 3% milk fat had the highest total score points (90), while the lowest one (61) was noticed in goat's milk inspite of the same content of milk fat. These results are mainly due to differences in solids not fat content. The goaty flavor played an important role in the previous evaluation. The lowest score given is ascribed to its undesirable goaty flavour.

Similar trend of organoleptic attributes properties were found in rice dessert prepared with milk standardized to 2 and 1% fat, as shown in Table (2).

Table 2. Sensory evaluation of rice dessert made from different types of milk

Characteristics	Buffaloe's milk	Ewe's milk	Cow's milk	Camel's milk	Goat's milk
(a) raw whole milk as control treatments					
Flavour (50)	48	46	40	38	35
Body & texture (35)	34	33	30	29	24
Appearance color (15)	14	13	11	11	9
Total (100)	96	92	81	78	68
(b) standardized milk fat to 3%					
Flavour (50)	44	40	38	36	30
Body & texture (35)	34	32	30	28	23
Appearance color (15)	12	12	10	10	8
Total (100)	90	84	78	74	61
(c) standardized milk fat to 2%					
Flavour (50)	42	38	35	34	28
Body & texture (35)	33	30	28	26	21
Appearance color (15)	12	11	10	10	7
Total (100)	87	79	73	70	56
(d) standardized milk fat to 1%					
Flavour (50)	40	35	34	32	26
Body & texture (35)	30	27	26	24	20
Appearance color (15)	10	11	10	10	7
Total (100)	80	73	70	66	53

Table 3. Nutritive value of rice dessert made with different types of raw milk

Nutritive facts/ 100 g	Buffalo milk	Ewe milk	Cow milk	Camel milk	Goat milk
Energy (calories)	192.1	180.9	160.6	162.5	158.8
Total fat	6.9	5.7	3.8	4.1	3.6
Total protein	4.5	4.4	3.8	4.0	3.5
Dietary fiber	0.6	0.6	0.6	0.6	0.6

Data presented in Table (3) show the nutritive values of rice dessert. It can be noticed that buffalo's rice milk contained the highest calories while goat's one scored the least but near the values of cow's and camel's rice dessert. Difference in calories contents are due to variations of fat and protein contents between different types of milk as reflected from data in Table (3).

It can be noticed that the average score points of rice dessert made with different types of 1% milk fat was found the lowest ones especially for flavour, body and texture.

CONCLUSION

Rice dessert, as an Egyptian dairy desert made with buffaloe's or ewe's milk and their corresponding ones standardized (1, 2 and 3% fat) had the highest score points than the other types of milk. Similar trends were reported by Mathur *et al* (1985) when preparing Phirni, an Indian sweet dish, from buffalo's milk of 0.1, 3.5 and 6.5% fat, with rice and sugar. They found that the best organoleptic product was obtained from 6.5% milk fat and the other products containing the lower levels of fat were also acceptable.

It is recommended that acceptable rice dessert, can be prepared from all types of milk except the goat's milk which is characterized by its undesirable flavour.

Further studies may be continued on this functional dairy dessert to prolong its shelf life, improve its organoleptic quality and using natural fruits. Diabetic sweet rice dish is also in our concern.

REFERENCES

- Abu-Lehia, I.H. (1987). A simple and rapid colorimetric method for lactose determination in milk. *Food Chemistry*, Vol. 24 page 233.
- Abu-Lehia, I.H. (1987). Composition of camel milk. *Milchwissenschaft*, Vol. 42 No. 6, 1987 page 368-371.
- Alkanhal, H.A. (1993). Goat's and camel's milk composition and freezing point. *Egyptian J. Dairy Sci.*, Vol. 21 No. Page 233.
- AOAC (1990). Official methods of Association of Official Analytical Chemists 15th ed. William Horints (ed.) Pub. Association of Official Analytical Chemists, Washington, D.C. USA.
- Devendra, C. (1980). Milk production in goats compared to buffaloes and cattle in humid topics *J. Dairy Sci.*, Vol. 63 page, 1755-1767.

- Kaul, J. and Mathur, B. (1982). Development and assessment of unfermented ice cream containing *L. acidophilus*. Indian J. Dairy Sci., Vol. 35 No. 3.
- Mahran, G.A.; El Alamy, H.A.; Hamzawi, L.F. and Eloly, M.M. (1990). Studies on the chemical composition of Egyptian ewe's milk. 1. Gross chemical composition and mineral contents. Egyptian J. Dairy Sci., Vol. 18 No. 2 page 235.
- Mathur, O.N., Bhattacharya, D.C. and Roy, N.K. (1985). Phirni an Indian sweet dish. Indian Dairyman (1985), vol. 37 No. 12 page 575-578. C.F. DSA, 1987 vol. 49 No. 1 page. 24.

**تقييم الأرز باللبن المصنع من أنواع مختلفة من اللبن
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يعتبر الأرز باللبن أحد أنواع حلويات اللبن المصرية لذلك تم إعادة من أنواع لبن كاملة مختلفة شملت اللبن البقرى ، الجاموسى ، الماعز ، الأغنام ، كما تم تعديل نسبة الدهن بهذة الألبان الى ١، ٢، ٣% وتصنيعها.

وقد وجد أن أفضل تقييم حسي للمنتجات المصنعة من لبن كامل خاصة المصنعة من اللبن الجاموسى تلاها لبن الغنم وقد أعطى اللبن البقرى والنوق درجات متساوية بينما كان لبن الماعز أقلها.

وقد كان المنتج المصنع من البان منخفضة فى نسبة الدهن (١%) مقبولا حسيا وقد تم تقدير القيمة التغذوية للمنتج وكان أعلاها الجاموسى وبصفة عامة كانت جودة المنتج متطابقة مع نشب الدهن فى اللبن وأفضل فى الألبان الكاملة وينصح بإنتاج هذا المنتج مع زيادة الدراسات على قوه حفظة وإنتاج منتجات وظيفية منه.